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and historically is mainly concerned with the growth of bacterial concepts from the time of Cohn's *Untersuchungen* to DeBary's *Vorlesungen*, 1872 to 1886. A few words are given to the early history of the subject, beginning with Leeuwenhoek, the discoverer of bacteria (1675), after which the epoch-making classification of Cohn (1872) ushers in the discussion of the comparative value of natural-history species, form species and physiological species.

The readiness with which certain bacteria pass from one form to another early attracted attention, and shook the belief in specific distinctions, raising the question, if various forms were not simply phenomena of growth, and if all bacteria should not be relegated to a single species or genus. The subsequent idea of monomorphic and pleomorphic forms led to expansion of the bacterial concept, and reinstated the idea of the existence of genuine species. Variability, the modifications due to change of function and of food supply, the significance of zoöglœa, the several classes of growth-forms, and the formation and germination of spores, successively receive attention, followed by a classification of genera on the basis of fructification, and a discussion of the phylogenetic relationship of bacteria.

Such in brief is the outline of the work. Only a consultation of the work itself, however, can adequately reveal the full yet careful handling which the subject has received. It is an excellent treatise, and will prove a welcome one to a wide circle of readers and students.

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## NOTES AND NEWS.

TSUGA CAROLINIANA Eng. is figured in *Gardeners' Chronicle*, December 18, 1886.

MR. MATSUMURA, professor of botany in the Imperial University of Japan, is a pupil of Dr. Sachs.

WE ARE ABLE to give, in the present number, a short account of Dr. Wigand as a botanist and teacher, from the pen of one of his pupils.

DR. T. J. W. BURGESS has published in a quarto pamphlet of 10 pages (reprinted from *Trans. Roy. Soc. Canada*), recent additions to Canadian Filicineæ.

A NEW WORK on the "Fresh-water Algae of the United States," by Rev. Francis Wolle, is in press. It will contain 150 plates, with over 2,000 figures.

THE CELERY FUNGUS (*Puccinia bullata*), during this last autumn, has been very prevalent in parts of England, in some cases every plant in a market garden being swept off by it.

DR. CHAS. E. BESSEY describes (*Am. Nat.*, Dec., 1886,) *Psoralea tenuiflora* as "another tumble-weed," occupying "ditches by the side of the railway," in S. Nebraska, in great masses.

DR. PAUL MORTHIER, of Neuchâtel, Switzerland, is dead. He was the founder of the Swiss Botanical Society, and has had the honor of being remembered in a familiar genus of fungi.

PROFESSOR RODOLFO LANCIA, of Rome, delivers a course of lectures on Roman archæology at the Johns Hopkins University during January, the second one of which is devoted to the flora and parks of ancient Rome.

THE FACT that some ovaries swell and ripen without ripening seed finds an explanation in the suggestion that the pollen-tube lives as a parasite upon the cells of the style, and so causes an extra flow of nourishment.

H. N. RIDLEY has concluded his list, in the *Journal of Botany*, of the monocotyledonous plants of New Guinea, collected by Mr. H. O. Forbes. New species abound, interesting among which are two new palms, and two new screw pines.

THE ENGLISH fungus forays for 1886 proved less successful than usual, owing to a scarcity of fungi and unpropitious weather. The Essex Field Club appears to have done the best, although the two days' search had to be made under umbrellas.

DRUGS AND MEDICINES for September, No. 2 of Vol. 2, has recently appeared, and, as heretofore, is a mine of botanical and medical information. The last part of the article on Magnolia, the first on Lobelia, and all on Asimina, fill up the number.

DR. H. G. BEYER, U. S. N., has been verifying and extending the researches of Hueppe and Lister on the microbe of lactic acid fermentation, which he thinks has to do with the souring of milk, while Laurent of Belgium has been studying the microbe of bread fermentation, called *Bacillus panificus*.

THE AMERICAN (formerly Michigan) Horticulturist has been merged into the *Popular Gardening*. Under the editorship of Mr. Charles W. Garfield, the eminent horticulturist, it was a valuable journal, giving promise of future growth and usefulness, and his dismissal was a calamity from which it did not recover.

In *Gardeners' Chronicle* for Dec. 11 (1886), *Abies Lowiana* is figured and described. In Bot. Calif. ii. 118, it is included under *A. concolor*. Prof. Sargent suggests that *A. grandis* may be but one variable species, including the typical or coast form, the Californian form (*A. Lowiana*), and the Utah and Colorado form (*A. concolor*).

WE ARE SORRY to learn that, by a fire in a Chicago bindery, Dr. L. M. Underwood has lost all the remaining copies of the second edition of his "Our Native Ferns." As all the bound copies have been sold, the book is now out of print. We hope that the demand for this excellent work will encourage the author to prepare a third edition.

DR. ALFRED R. WALLACE, who shares the honor with Charles Darwin of originating the theory of natural selection, recently delivered four lectures at the Peabody Institute at Baltimore, on the theory of development and the origin and uses of color in animals and plants, part of the fourth lecture being devoted especially to plants.

IN A PAPER read at the recent Potato Tercentenary Conference, published in *Gardeners' Chronicle*, Dr. J. G. Baker states that the five distinct species of *Solanum* which are tuber-bearing, are all natives of America. Two of them (*S. tuberosum* and *S. Jamesii*) are from our Rocky Mountain region, the first extending into S. America, two (*S. cardiophyllum* and *S. oxycarpum*) are Mexican, the remaining one (*S. Commersonii*) South American.

THE FIRST annual report of the forest commission of New York for 1885, published a short time since, contains, besides other valuable matter, an appendix giving a list of works on forestry to be found in ten of the chief libraries of the country, covering thirty-six pages, and nearly a hundred and fifty additional titles of magazine articles.

DR. BESSEY calls attention to the fact that the roughness of certain uredospores can only be seen when mounted dry. His attention was called to the fact by a student's difficulty in seeing the prickly wall of the uredospores of *Puccinia coronata* when mounted in water. When mounted dry the prickles appeared with great distinctness.

TWO LARGE American walnuts (*Juglans nigra*) are growing near London, according to a correspondent of the *Gardeners' Chronicle*, which measure 129 inches each in circumference, at four feet from the ground, and remain nearly the same size for fully fifteen feet upward, the total height of the trees being between 90 and 100 feet. This exceeds the size of this species mentioned in Michaux's *Sylva*.

THE MADAGASCAR lattice-leaf, *Ouvirandra fenestralis*, grows and flowers at Kew, with leaves nearly a foot long. A plant in the conservatory of Cornell University has leaves about half as long, but it is found difficult to keep them sufficiently free from unicellular algæ and fine sediment for healthy growth. The plant, besides being rare and beautiful, is morphologically interesting on account of its perforated leaves.

MR. C. E. BROOME, F. L. S., an associate of the Rev. M. J. Berkeley in cryptogamic studies, and a careful observer of English fungi, died November last, aged 74 years. The record of his scientific work in the publication of new species, conjointly with Mr. Berkeley, began in 1848, in the *Annals of Natural History*, and continued in that journal and *Grevillea* till near the time of his death. Although a man of admirable parts, his retiring disposition kept him a stranger to all but immediate neighbors and associates.

MR. F. H. KNOWLTON has distributed, as a reprint from the Proc. Biol. Soc. of Washington (D. C.), Vol. III, additions to the flora of Washington and vicinity, as supplementary to Ward's "Guide to the Flora of Washington and vicinity." It is divided into six parts, as follows: 1. List of vascular plants added, numbering 35 species, besides 4 hybrid oaks; 2. Revision of the Musci and Hepaticæ, by Rev. E. Lehnert; 3. List of lichens, by the same author; 4. Changes in nomenclature; 5. New localities for rare species; 6. Species excluded, 4 in number.

A VERY INTERESTING PAPER by Prof. C. S. Sargent, in the *American Journal of Science* for December (1886), gives some account of the journey of André Michaux to the high mountains of Carolina, in December, 1788. This journey was to collect living plants of *Magnolia cordata*, a species which no botanist of the present century has discovered in a wild state. From Prof. Sargent's investigations it seems certain that Michaux's *M. cordata*, as known in gardens, is a rare and local variety of *M. acuminata*, and as such Prof. Sargent describes it. Tracing Michaux's journey in search of this form, the rare *Shortia galacifolia* was rediscovered, undoubtedly referred to by Michaux as "*Arbuste*," with "*f. denticulées*." In a note appended to Prof. Sargent's paper, Dr. Gray announces the rediscovery of *Shortia* at another station in the vicinity, where there were "rocks covered with it." It looks as if this rarest of plants is at last found in sufficient abundance to insure its continuance, as well as to enable botanists to obtain specimens of it at a reasonable expense.